

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Original) A method for conveying bidirectional data over a transformer comprising the steps of:

- modulating an alternating current signal with outbound data;
- driving a first side of the transformer with the modulated signal;
- receiving the modulated signal from a second side of the transformer;
- extracting outbound data from the received modulated signal;
- modulating according to inbound data the load presented to the second side of the transformer when the alternating current signal is not modulated; and
- receiving inbound data by sensing said load modulation.

2. (Original) The method of Claim 1 wherein modulating the alternating current signal with outbound data comprises switching the phase of an alternating current signal according to a serial bit stream coincident with a clock.

3. (Original) The method of Claim 1 wherein extracting outbound data comprises:  
extracting a clock signal from the received modulated signal; and  
sampling the received modulated signal according to the extracted clock signal.

4. (Original) The method of Claim 3 wherein extracting a clock signal comprises:  
sensing transitions in the received modulated signal;  
generating an independent clock signal; and  
synchronizing the independent clock with the transitions.

5. (Original) The method of Claim 1 wherein modulating the load presented to the second side of the transformer comprises:

- varying the impedance presented to the transformer according to a serial data stream coincident with an extracted clock signal.

6. (Original) The method of Claim 1 further comprising:  
generating an analog signal according to the extracted outbound data signal; and  
varying the impedance of a circuit load according to the analog signal.

7. (Original) The method of Claim 1 wherein modulating the load presented to the second side of the transformer comprises:  
generating a digital value according to the voltage across a circuit load coincident with an extracted clock signal; and  
varying the impedance presented to the second side of the transformer according to the digital value.

8. (Original) An apparatus for conveying bidirectional data across a galvanic barrier comprising:  
signal generator;  
signal modulator capable of modulating with outbound data a signal produced by the signal generator;  
transformer having a first side capable of receiving a modulated signal from the signal modulator and a second side;  
data extractor capable of extracting outbound data from a modulated signal received from the second side of the transformer;  
transformer load modulator capable of modulating the load on the second side of the transformer according to inbound data; and  
inbound data recovery unit capable of determining inbound data by sensing load modulations induced by the transformer load modulator.

9. (Original) The apparatus of Claim 8 wherein the signal modulator comprises a phase modulator capable of altering the phase of the signal coincident with a clock.

10. (Original) The apparatus of Claim 8 wherein the data extractor comprises:  
clock extractor capable of extracting a clock from a received modulated signal; and

sampling device capable of sampling the received modulated signal according to the extracted clock.

11. (Original) The apparatus of Claim 10 wherein the clock extractor comprises:  
controllable oscillator capable of generating a clock according to a control signal; and  
comparator capable of generating the control signal by comparing transitions in a received modulated signal with transitions in the generated clock.

12. (Original) The apparatus of Claim 8 wherein the transformer load modulator comprises:

impedance element;  
synchronizer capable of synchronizing inbound data with an extracted clock signal; and  
switch capable of attaching the impedance element to the second side of the transformer according to the synchronized inbound data.

13. (Original) The apparatus of Claim 8 further comprising:  
digital-to-analog converter capable of generating an analog signal according to extracted outbound data;

line circuit load capable of presenting a load to a communications channel;  
impedance element; and  
analog gate capable of linearly imparting the impedance element across the line circuit load according to the analog signal.

14. (Original) The apparatus of Claim 8 further comprising:  
line circuit load capable of presenting a load to a communications channel;  
analog-to-digital converter capable of generating a digital value according to the voltage present across the line circuit load;  
impedance element; and  
switch capable of attaching the impedance element to the second side of the transformer according to the digital value.

15. (Original) A system-side isolation controller comprising:  
signal generator;  
signal modulator capable of modulating a signal produced by the signal generator; and  
inbound data recovery unit capable of determining inbound data by sensing load modulations exhibited by a transformer.

16. (Original) The system-side isolation controller of Claim 15 further comprising a transformer driver capable of driving the transformer with the modulated signal.

17. (Original) A line-side isolation controller comprising:  
data extractor capable of extracting outbound data from a modulated signal received from a second side of a transformer; and  
transformer load modulator capable of modulating the load presented to the second side of the transformer according to inbound data.

18. (Original) The line-side isolation controller of Claim 17 wherein the data extractor comprises:  
clock extractor capable of extracting a clock signal from a received modulated signal; and  
sampling device capable of sampling the received modulated signal according to the extracted clock signal.

19. (Original) The line-side isolation controller of Claim 18 wherein the clock extractor comprises:  
controllable oscillator capable of generating a clock according to a control signal; and  
comparator capable of generating the control signal by comparing transitions in a received modulated signal with transitions in the generated clock.

20. (Original) The line-side isolation controller of Claim 17 further comprising:  
digital-to-analog converter capable of generating an analog signal according to extracted outbound data;

analog gate capable of linearly imparting a first impedance element across a line circuit load according to the analog signal;

analog-to-digital converter capable of generating a digital value according the voltage present across the line circuit load;

impedance element; and

switch capable of attaching a second impedance element the second side of the transformer according to the digital value.